WHAT IS CLAIMED IS:

1. An optical signal processor, comprising:

a saturable absorber area including a substrate, an active layer, a clad layer, and a first upper electrode which are sequentially formed on one face of the substrate, and a first lower electrode formed on the other face of the substrate; and

a gain-clamped optical amplifier area including a substrate having a diffraction grating for generating a laser beam, an active layer, a clad layer, and a second upper electrode which are sequentially formed on one face of the substrate, and a second lower electrode formed on the other face of the substrate, the second upper electrode being isolated from the first upper electrode of the saturable absorber area.

2. The optical signal processor as claimed in claim 1, wherein the saturable absorber area further includes an ohmic contact layer formed between the clad layer and the first upper electrode, and the gain-clamped optical amplifier area further includes an ohmic contact layer formed between the clad layer and the second upper electrodes.

3. The optical signal processor as claimed in claim 1, wherein the saturable absorber area and the gain-clamped optical amplifier area are formed on one substrate, and the first and second upper electrodes are isolated from each other according to an etched groove.

4. The optical signal processor as claimed in claim 1, wherein the facets of the saturable absorber area and the gain-clamped optical amplifier area are shielded by an anti-reflection thin film.

5. The optical signal processor as claimed in claim 1, wherein the period of the diffraction grating is varied to control the wavelength of the laser beam generated by the diffraction grating.

6. The optical signal processor as claimed in claim 5, wherein the period of the diffraction grating is controlled such that the wavelength of the laser beam is included in a gain bandwidth of the active layer but is not included in an amplification bandwidth of the gain-clamped optical amplifier area.

7. The optical signal processor as claimed in claim 1, wherein the substrate of the saturable absorber area and the gain-clamped optical amplifier area is formed of n-type InP, the active layer is formed of InGaAsP, and the clad layer is made of InP.

8. An optical signal processor, comprising:

a substrate including a diffraction grating for generating a laser beam;

an active layer formed on one face of the substrate;

a clad layer formed on the active layer;

first and second upper electrodes formed on the clad layer, having a distance between them; and

a lower electrode formed on the other face of the substrate,

wherein the diffraction grating is formed at only one side of the substrate in the direction of the width of the substrate, and the first and second upper electrodes are respectively formed on the region having the diffraction grating and the region that does not include the diffraction grating.

9. A method for fabricating an optical signal processor, comprising:

forming a substrate;

forming a diffraction grating inside the substrate such that the diffraction grating is included in only one side of the substrate in the direction of the width of the substrate;

sequentially forming an active layer, a clad layer, and an upper electrode on one face of the substrate;

forming a lower electrode on the other face of the substrate; and

forming a groove in the upper electrode to divide the upper electrode into two parts that are isolated from each other, one of the two parts being located on the portion of the substrate including the diffraction grating, the other one of the two parts being placed on the region of the substrate that does not include the diffraction grating.